NOTES ON THE LAND REPTILES OF WALLIS AND FUTUNA, SOUTH-WEST PACIFIC

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Abstract. This first account of the land reptiles of the Wallis and Futuna islands is based largely on specimens I collected in 1993 and that J.-C. Thibault and I. Guyot collected in 1985-6. Four species of gecko, seven skinks and a terrestrial snake are known from the group, with a greater diversity on Futuna than on Wallis. Many are common and widespread Pacific species. Of those that are not, *Emoia adspersa* is confirmed from Futuna after examination of specimens collected last century. *E. murphyi*, which was hitherto recorded only further east in the Samoa–Tonga area, is reported from Futuna for the first time. *E. trossula* is tentatively identified from Futuna, but further study may show that the population belongs instead to the closely–related *E. samoensis*. The known distribution of the snake *Candoia bibroni* now includes Futuna and 'Alofi.

Résumé. Ce premier inventaire des reptiles terrestres des îles Wallis et Futuna est largement basé sur des spécimens que j'ai collecté en 1993 et ceux collectés par J.–C. Thibault et I. Guyot en 1985–6. Quatre espèces de geckos, sept scinques et un serpent terrestre sont connus de ce groupe d'îles où la diversité spécifique est supérieure à Futuna qu'à Wallis. Beaucoup de ces espèces sont communes et largement distribuées dans le Pacifique. Parmi les espèces plus restreintes, la présence d'*Emoia adspersa* est confirmée sur Futuna après examen de spécimens collectés au siècle dernier. *E. murphyi*, connu auparavant seulement plus à l'est dans la région des Samoa–Tonga, est mentionné pour la première fois de Futuna. *E. trossula* est identifié avec réserve de Futuna; des études ultérieures pourraient montrer que ces populations appartiennent à l'espèce proche *E. samoensis*. La distribution du serpent *Candoia bibroni* englobe maintenant Futuna et 'Alofi.

The French Overseas Territory of Wallis and Futuna lies west of Western Samoa and north–east of Fiji. Wallis ('Uvea) is a low island (to 144 m a.s.l.) of 96 km^2 surrounded by about 20 islets enclosed within a barrier reef. Futuna (80 km^2) and its neighbour 'Alofi (c. 35 km^2), previously called the Hoorn (or Horne) Islands, are high islands (to c. 500 m a.s.l.) about 230 km south–west of Wallis and they lack a surrounding lagoon. Guyot & Thibault (1988) and Anonymous (1986) gave maps of the islands.

I spent seven days on Wallis (22–27 September and 4–6 October 1993) travelling all the roads of 'Uvea by car, covering some central and northern parts on foot, and landing on three islets (Nukulaelae, Nukuloa and Nukuhione) on 23 September. I spent seven days on Futuna (27 September to 4 October 1993) during which time I travelled the circular coast–road by car, walked along the coast between the villages of Fiua and Taoa, and climbed inland from Leava through plantation, secondary forest and "toafa" fernland. Rough seas precluded a visit to 'Alofi.

No previous account of the land reptiles of the territory has been published. The Whitney South Sea Expedition visited both islands in 1925 and collected many birds (Guyot & Thibault 1987), but the account of the herpetology of the expedition (Burt & Burt 1932) cites only two specimens from Wallis and none from Futuna (the latter is listed on p. 469 as "Satune (Fatuna)" *(sic)* in the Samoan group).

Here I report my observations of reptiles, and specimens collected, the latter now held at the Auckland Institute and Museum (AIM). Other museum voucher specimens known to me are cited. Specimens collected by Thibault and Guyot in 1985–6 are at the Muséum National d'Histoire Naturelle, Paris (MNHN), and I have examined a selection of these. The two specimens from Wallis collected by the Whitney South Sea Expedition are at the American Museum of Natural History, New York (AMNH). Four specimens from 'Alofi are at The Field Museum, Chicago (FMNH).

The Museum für Naturkunde der Humboldt–Universität, Berlin (ZMB), has nine skinks from "Futuna, Fidji Inseln", all of which I have examined. I have identified them as follows: *Emoia nigra* (5), *E. adspersa* (2), *E. trossula* (1) and *E. murphyi* (1). They are attributed to the Godeffroy brothers who had a private museum in Hamburg last century. The collectors and dates of collection are not known (R. Günther, *pers. comm.*), but two specimens were used by Peters (1874), so these, and perhaps all nine, were collected before 1874. In the Pacific there are two islands named Futuna (Motteler 1986), the one with which this paper is concerned, and Futuna (= Erronan) in Vanuatu. The former is an isolated island only 250 km from the north–east edge of the Fiji archipelago, so it seems understandable that early collectors would link this Futuna with Fiji. For this reason, and because all the Godeffroy lizards that are not *E. nigra* belong to species that do not occur in Vanuatu, I am content that the ZMB specimens are from the Futuna of the Wallis and Futuna group. Among the collectors sent to the South Pacific by the Museum Godeffroy was Dr E. Gräffe (Watling 1982) who visited Futuna in 1866 and again in 1867 (Guyot & Thibault 1987).

The records of reptiles are summarised in Table 1. All the species of Wallis and Futuna occur also in Western Samoa, except that *Emoia trossula* on the former is a counterpart to *E. samoensis* on the latter. My identification key to Western Samoan reptiles (Gill 1993) suffices for Wallis and Futuna if *trossula* is read for *samoensis* (the

Table 1. The land reptiles of Wallis, Futuna and 'Alofi. o = collected or seen by me in 1993 (specimens at AIM), x = not found by me but collected by Guyot & Thibault in 1985–86 (specimens at MNHN), z = based on specimens at ZMB.

	Wallis	Futuna	'Alofi
Geckos			
Gehyra oceanica	o	o	x
Hemidactylus frenatus	o	o	
Lepidodactylus lugubris	o	o	x
Nactus pelagicus		o	
Skinks			
Cryptoblepharus poecilopleurus		x	
Emoia adspersa		z	
Emoia cyanura	o	o	
Emoia impar			x
Emoia murphyi		o	x
Emoia nigra	o	o	x
Emoia trossula		o	
Snakes			
Candoia bibroni		x	o

characters chosen for the key are nearly the same in the two species). Where measurements are given in the present paper, SVL stand for snout–vent length. I follow the redefinition of the cryptic species *E. cyanura* and *E. impar* as set out by Ineich & Zug (1991).

ANNOTATED SPECIES LIST

OCEANIC GECKO *Gehyra oceanica* (Lesson, 1828)
Wallis. Common in forest away from human habitations (AIM H1614, H1623) and as a house gecko on outside and inside walls (AIM H1594–5, H1601, H1609–10, H1625). Other records: MNHN 1986.675–6.
Futuna. Seen under bark of forest trees. Three large rounded eggs (AIM H1627), found in a rotten log in a plantation, are assumed to belong to this species. Other records: MNHN 1986.679–80 (Futuna); 1986.677–8 ('Alofi).

HOUSE GECKO *Hemidactylus frenatus* Duméril & Bibron, 1836
Wallis. Common house gecko. AIM H1593, H1596–7.
Futuna. Common house gecko. AIM H1615–7, H1619–20.

SAD GECKO *Lepidodactylus lugubris* (Duméril & Bibron, 1836)
Wallis. Common on 'Uvea as a house gecko and in vegetation close to human habitations (AIM H1598–1600, H1605–8, H1611–3). Also found in vegetation distant from habitations (AIM H1624). Found on Nukuhione Islet close to a *fale* (AIM H1602–4). Of 13 adults from Wallis, seven seem closest to Clone C of Ineich & Ota (1992) and five seem to be Clone A. Members of the same clone were always found together. The thirteenth specimen (AIM H1624), from a forest tree away from human habitations, has a few irregularly spaced dorsal blotches and seems atypical. Other records: MNHN 1986.681–5.
Futuna. Common as a house gecko (AIM H1618, H1638–42) and in vegetation away from dwellings (AIM H1621). Other records: MNHN 1986.686, 1986.688 (Futuna); 1986.687 ('Alofi). FMNH 211866–9 ('Alofi, examined by I. Ineich, *pers. comm.*).

PACIFIC SLENDER-TOED GECKO *Nactus pelagicus* (Girard, 1857)
Futuna. One specimen found at Tavai in a taro field (AIM H1622).

SNAKE-EYED SKINK *Cryptoblepharus poecilopleurus* (Wiegmann, 1834)
Futuna. In December 1985 Thibault and Guyot collected an immature specimen (MNHN 1986.689; 25 mm SVL) from a littoral site on the north side of Point Vele.

MICRONESIAN SKINK *Emoia adspersa* (Steindachner, 1870)
Futuna. Peters (1874: 160) described a new species, *Euprepes (Mabuia) parvisquameus*, now synonymised with *E. adspersa* (see Schwaner & Brown 1984), from Western Samoa "und den Fidji–Inseln (Futuna)". The syntypes are at ZMB (R. Günther, *pers. comm.*), not presumed lost as stated by Brown (1991). ZMB 5930 (77.1 mm SVL) and ZMB 53774 (74.6 mm SVL) are pale grey–brown with no dorsal striping, and dark speckling on the back, sides and limbs. They have 56 mid–body scale rows and 24–25 fourth toe lamellae, which agrees with the diagnosis of *E. adspersa* (Brown 1991). This confirms the presence of this species in Wallis and Futuna. *E. adspersa* is not unexpected as it occurs in Western Samoa and Niuafo'ou (northern Tonga; Gill, Rinke & Zug 1994) which are close to Futuna.

WHITE–BELLIED SKINK *Emoia cyanura* (Lesson, 1826)
Wallis. Common, in open areas, plantations, forest and forest edges. AIM H1562–72, H1574–8, H1592. Other records: MNHN 1986.656–60 (determined by I. Ineich).
Futuna. Common, as above. AIM H1579–81, H1585–8. Other records: MNHN 1986.663–4 (Futuna, determined by I. Ineich).

DUSKY–BELLIED SKINK *Emoia impar* (Werner, 1898)
Futuna. In January 1986 Thibault and Guyot collected two specimens (MNHN 1986.661–2, determined by I. Ineich) on 'Alofi in forest 150 m above sea–level.

MURPHY'S SKINK *Emoia murphyi* Burt, 1930
Futuna. I saw *murphyi*–like skinks basking on several garden walls at Fiua, and caught three specimens (AIM H1582–4; 42–68 mm SVL). They have speckled dorsal surfaces and no longitudinal stripes, 28 mid–body scale rows and 61–69 fourth toe lamellae. This agrees with the meristics of *E. murphyi* from Samoa and Tonga which have 26–32 mid–body scales and 60–81 lamellae (Brown 1991). In life the Futuna specimens had a pale brown back and bright yellow–green underparts. In contrast, specimens of *E. murphyi* from Samoa and Tonga that I have seen in life had a greyish back and bright lime–green underparts.

In January 1986 Thibault and Guyot collected two specimens from forest near the shore on 'Alofi (MNHN 1986.665–6; both 78 mm SVL) and a juvenile from a valley on Futuna (MNHN 1986.674; 33 mm SVL). In preservative all three specimens have darkened. There is now no sign of bright ventral colours, but for MNHN 1986.665 the MNHN catalogue notes "ventre et dessous de la tête très vert". The Thibault–Guyot specimens were entered in the MNHN catalogue as *Emoia samoensis*, but they have 28 mid–body scale–rows and 61–67 fourth toe lamellae. I conclude that they belong to the same taxon as the AIM specimens.

Also conspecific is ZMB 5932 (46.5 mm SVL), collected last century, which has 28 mid–body scale–rows and 71 fourth toe lamellae.

PACIFIC BLACK SKINK *Emoia nigra* (Jacquinot & Guichenot, 1853)
Wallis. Common, in gardens, plantations and forest. AIM H1573, H1590–1. Other records: AMNH 40575–6 ('Uvea); MNHN 1986.667 ('Uvea), 1986.672–3 (Nukuloa Islet).
Futuna. Common, as above. Also seen foraging on supralittoral rocks and among creepers at the high–tide line on a sandy beach. Other records: MNHN 1986.668, 1986.671 (Futuna); MNHN 1986.669–70 ('Alofi). ZMB 5927–9, 53772–3 ("Futuna"); maximum SVL 107.7 mm.

DANDY SKINK *Emoia trossula* Brown & Gibbons, 1986
Futuna. I saw several large skinks basking on tree trunks in forest of the escarpment east of Leava. They were about as large as *E. nigra* and I took them to be *E. trossula* or *E. samoensis*. Watched closely through binoculars they were dark grey–green dorsally (almost as dark as *nigra*), with transverse bands and bright streaks just visible. The sides of the head were pale, and pale ventral colours extended dorsally a little at the sides.

In the hills behind Leava at about 100 m above sea–level I caught a juvenile skink (AIM H1589, 32 mm SVL) under the bark of a forest tree near a banana plantation. It is pale brown dorsally with dark transverse markings and has about 36 mid–body scale rows (the count varies between 34 and 39) and 44–45 fourth toe lamellae. This is within

the established range for Fijian *E. trossula* – mid–body scales 32–40, lamellae 43–54; Brown (1991) – though it is also close to the range for *E. samoensis*.

ZMB 5931 (82.5 mm SVL), collected from Futuna last century, is brown with a striking dorsal pattern of dark transverse bands and bright cream–coloured longitudinal streaks (Fig. 1). This pattern is typical of *Emoia trossula* but rare in *E. samoensis* (Brown 1991). ZMB 5931 has 32 or 33 mid–body scale rows, 39–41 fourth toe lamellae and 68–70 dorsal scale rows between the parietals and the tail base opposite the vent.

Because of the bright streaks on ZMB 5931, and the presence of such streaks on specimens that I saw through binoculars, I tentatively assign the Futuna population to *E. trossula*.

Fig. 1. *Emoia trossula* (ZMB 5931; 82.5 mm SVL) collected from Futuna last century. Photo: A. Carpenter.

PACIFIC BOA *Candoia bibroni* (Duméril & Bibron, 1844)

Futuna. Claude Lépert gave me a dried specimen (AIM H1626, c. 860 mm total length), and later sent me a spirit specimen (AIM H1637, c. 830 mm), both collected on 'Alofi. MNHN 1986.690, collected at Point Vele, Futuna, in 1985, is about 980 mm long. All three specimens have a rounded canthus rostralis, an enlarged preocular, and supralabials excluded from the eye by a row of small scales. These features establish that the specimens are *bibroni* and not one of the other two species of *Candoia* in the Pacific.

OTHER NOTES

I took fresh weights of lizards with a Pesola spring balance. The heaviest specimens were as follows: *Gehyra oceanica* 15.6 g, *Hemidactylus frenatus* 5.4 g, *Lepidodactylus lugubris* 1.8 g, *Emoia cyanura* 3.1 g, *E. murphyi* 5.7 g, *E. nigra* 19.9 g. Two or more species of house gecko in the same building were noted at three sites. *Lepidodactylus lugubris* was common to all. One site (Wallis) had *Gehyra oceanica*, one had *Hemidactylus frenatus* (Futuna) and the third (Wallis) had both.

There are many small lakes on 'Uvea and some frogs have been collected (MNHN 1986.691–3). I have not examined them but they are said to be the Australian species *Litoria aurea*, whose date of introduction is unknown. J.–C. Thibault (*pers. comm.*) found the frogs to be abundant during wet weather in January 1986 at lakes Kikila, Lanumaha and Alofivai. They were in lakeside vegetation and on the open water. Amplexus was noted.

DISCUSSION

On current evidence the confirmed terrestrial reptile fauna of Wallis and Futuna comprises 12 species – three geckos and two skinks on Wallis; four geckos, seven skinks and a terrestrial snake on Futuna (including 'Alofi). The species list may increase still further. The most probable additions are the skink *Lipinia noctua*, and the geckos *Gehyra mutilata, Hemidactylus garnotii* and *Hemiphyllodactylus typus*, which are widespread in the Pacific.

All the species of lizards on Futuna are likely to occur on its neighbour 'Alofi, and *vice versa.* It would not be surprising if *Nactus pelagicus* and *Emoia impar* turn up on Wallis, but the lesser diversity on Wallis, which is the same for land birds (Gill 1995), is probably real and reflects, at least partly, the greater destruction of forest habitats on Wallis. *Cryptoblepharus* may prove to be more common, although on both Wallis and Futuna I searched specifically for it on tree trunks, walls and rocks close to the shore, without success.

More specimens are needed to confirm the identity of skinks here recorded as *Emoia trossula* on the basis of a recently–collected juvenile and an adult from last century. Further work is also needed on the taxonomic status of *E. trossula* and *E. samoensis*. They are not well separated on scalation. Some Fijian, Tongan and Cook Island *trossula* lack the white streaks on the back and sides that tend to be diagnostic, whereas a few *samoensis* from Samoa have the streaks (Brown 1991). The presence on Futuna of *E. trossula* (or *samoensis* as the case may be) is not surprising given that between them the two species occupy all the main islands immediately to the south and east of Futuna. *E. trossula* has also been noted on Rotuma, Futuna's nearest neighbour to the north–west (Zug *et al.* 1988).

Emoia murphyi, previously known only from Western Samoa and northern Tonga (Gill 1993), is now shown to occur further west on Futuna. This too is not surprising, since Wallis and Futuna lies only about 600 km west of the Samoas, and the two island groups are considered to belong together in a distinct biogeographic region (Dahl 1980). Similarly, the presence of *Candoia bibroni* on Futuna and 'Alofi, though a new record not noted in the review by McDowell (1979), is not unexpected. This species occurs widely in the eastern Solomon Islands, Vanuatu, the Loyalty Islands, Fiji and the Samoas (McDowell 1979).

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